

FIG.1

FIG.1A

FIG.1B

Forming the (7\*7) reconstructed surface of Si(111)substrate by in-situ thermal annealing process

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graph TD; A[Forming the (7*7) reconstructed surface of Si(111)substrate by in-situ thermal annealing process] --> B[Performing a nitrogen-plasma nitridation process to the Si (111)substrate to form a single-crystal Si3N4 diffusion-barrier buffer layer thereon]; B --> C[Performing an Al pre-deposition process at low temperature to form an Al pre-deposition atomic layer on the single-crystal Si3N4 diffusion-barrier buffer layer];
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1

Performing a nitrogen-plasma nitridation process to the Si (111)substrate to form a single-crystal Si<sub>3</sub>N<sub>4</sub> diffusion-barrier buffer layer thereon

2

Performing an Al pre-deposition process at low temperature to form an Al pre-deposition atomic layer on the single-crystal Si<sub>3</sub>N<sub>4</sub> diffusion-barrier buffer layer

3

FIG.1A

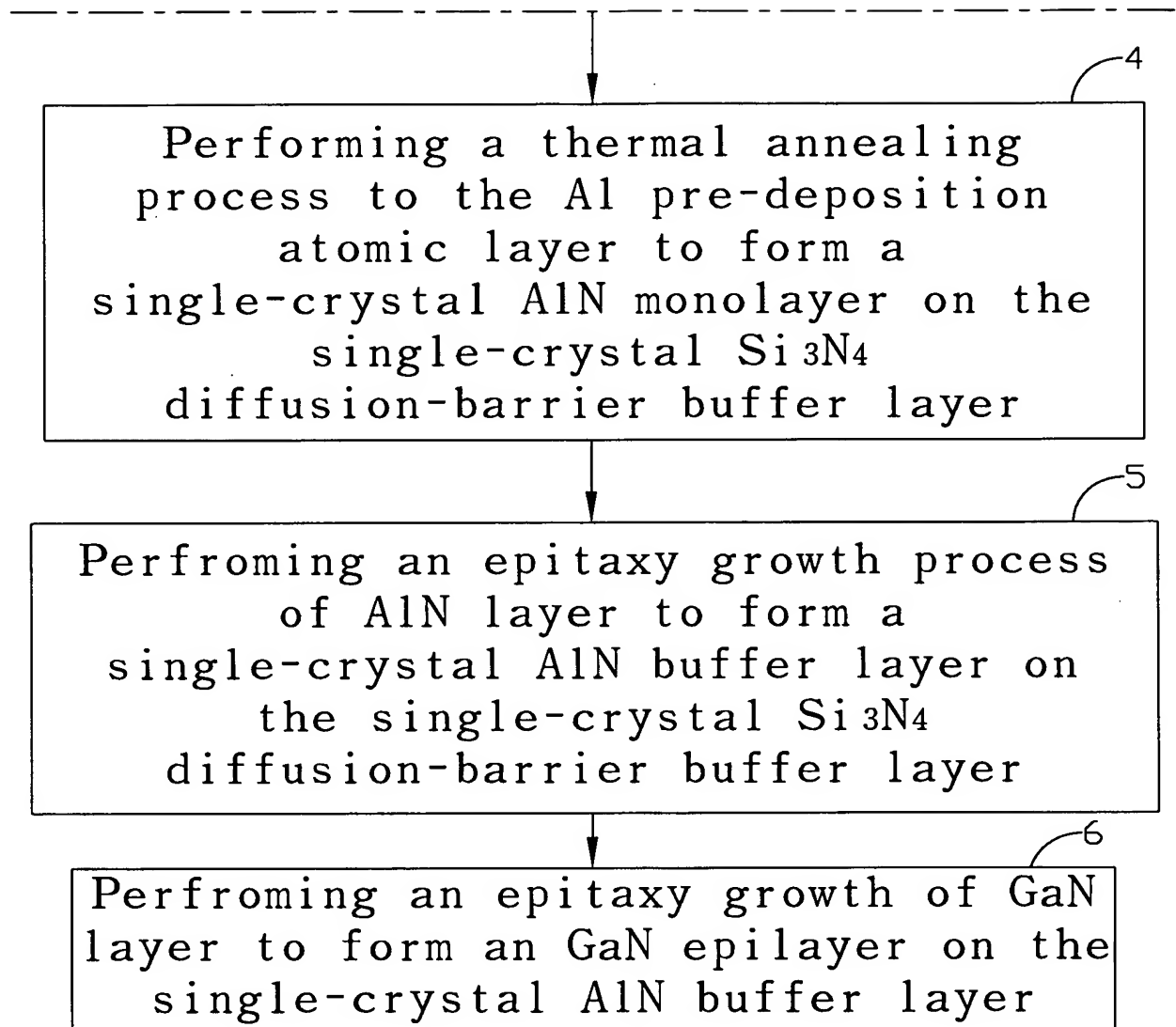


FIG.1B

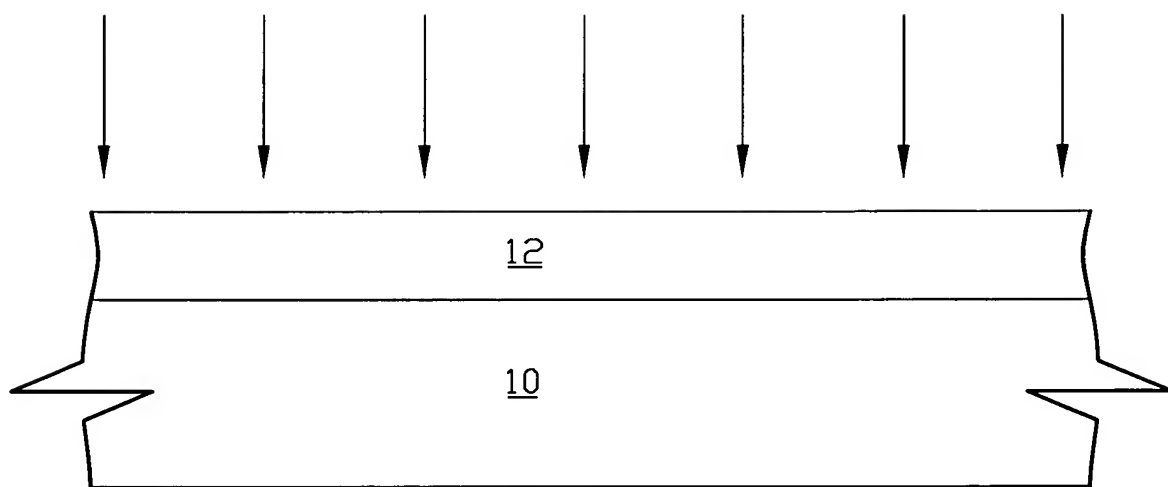


FIG. 2A

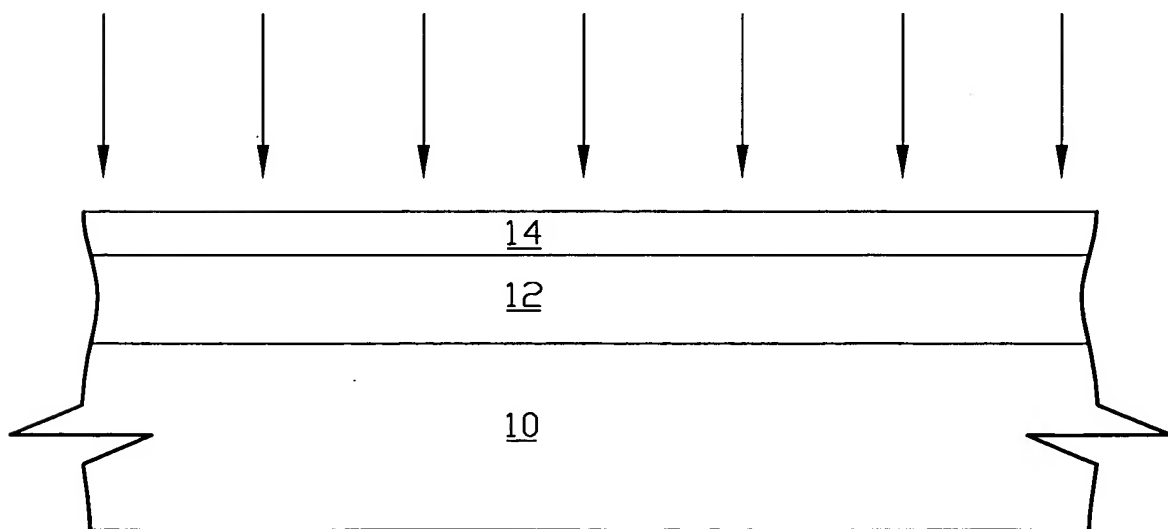


FIG. 2B

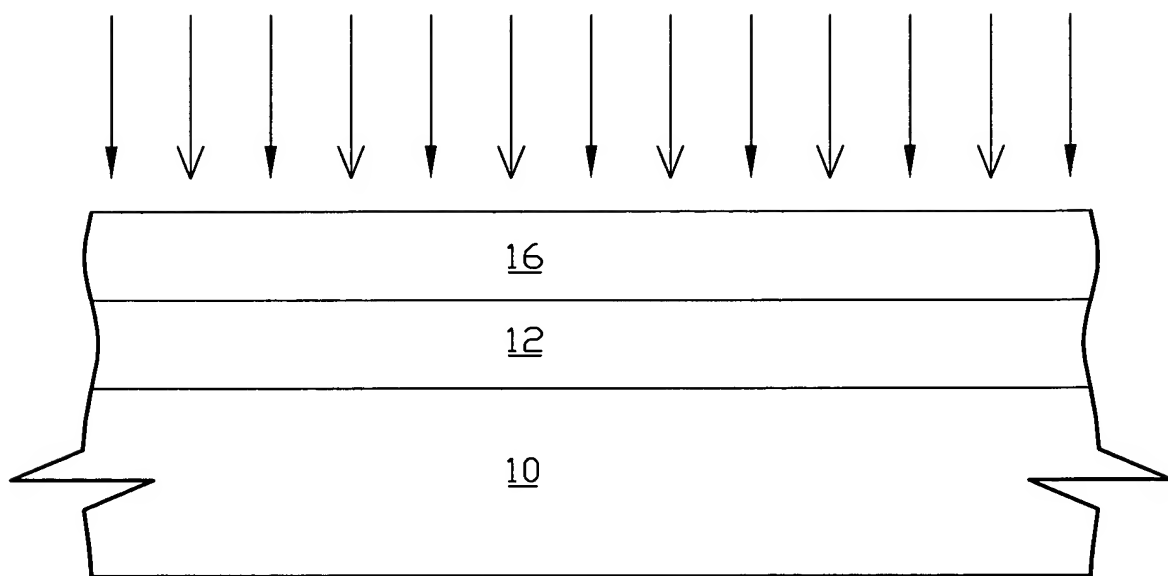


FIG. 2C

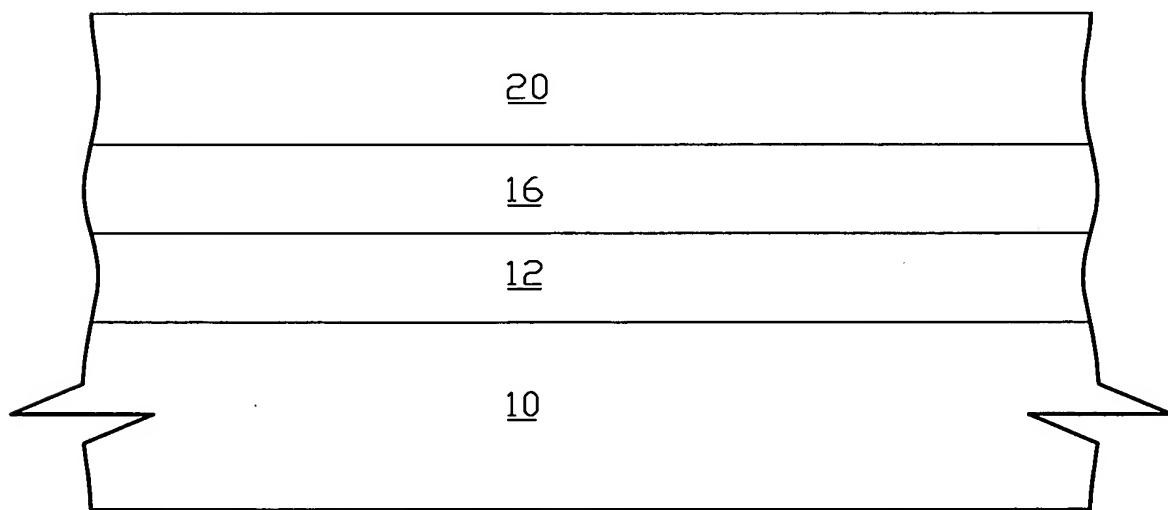


FIG. 2D

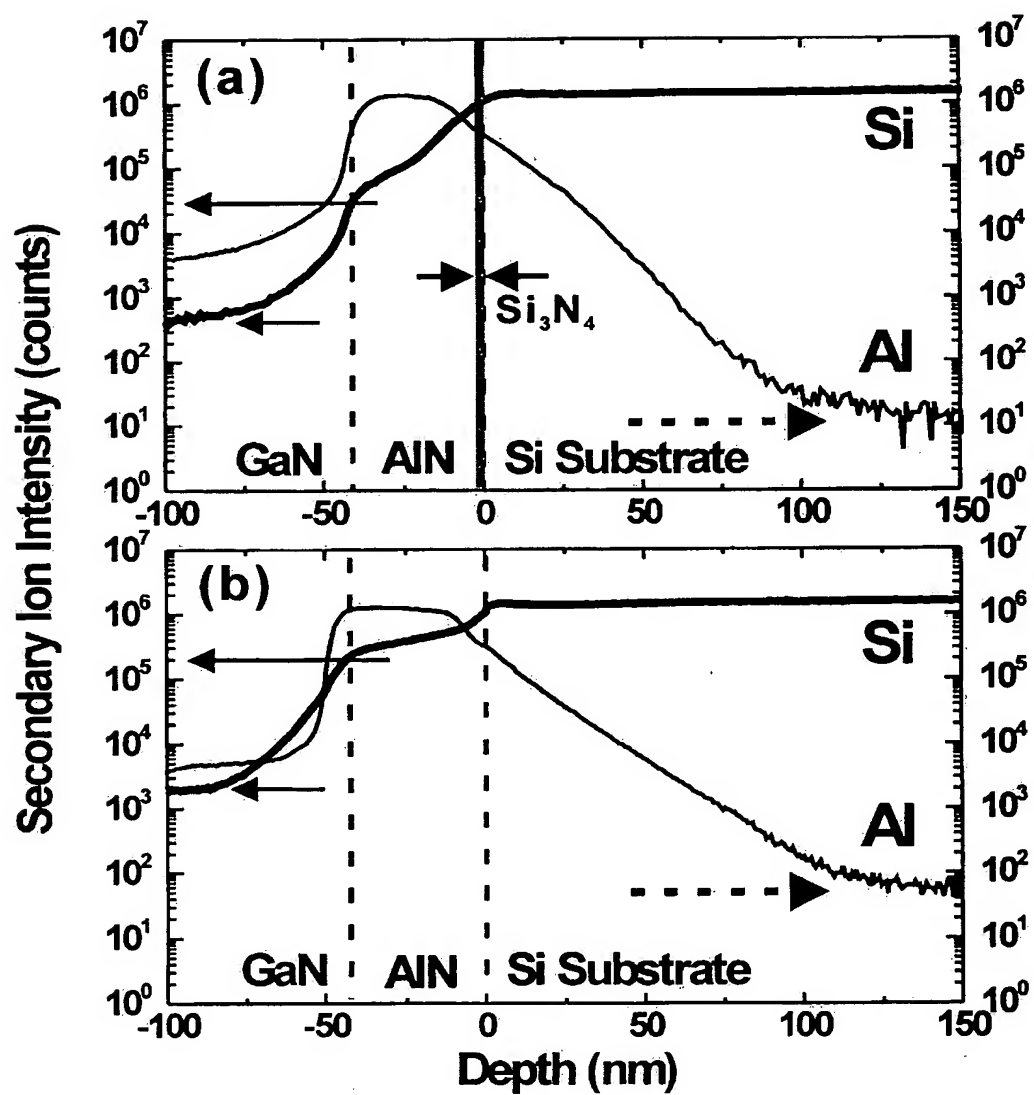


FIG. 3

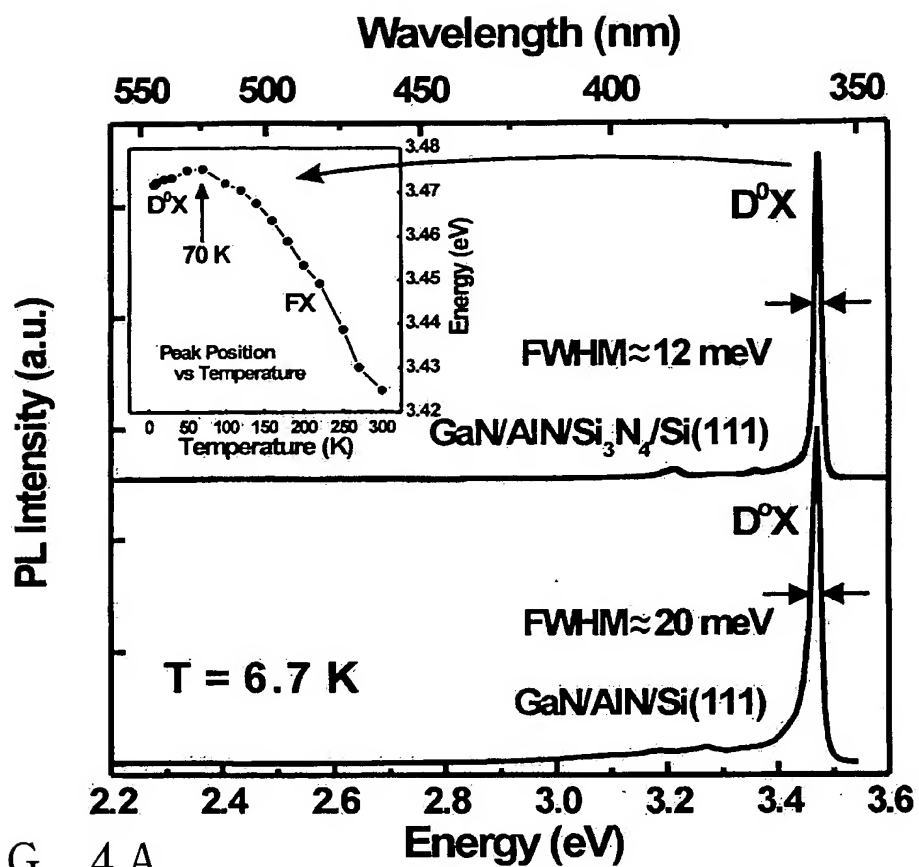


FIG. 4A

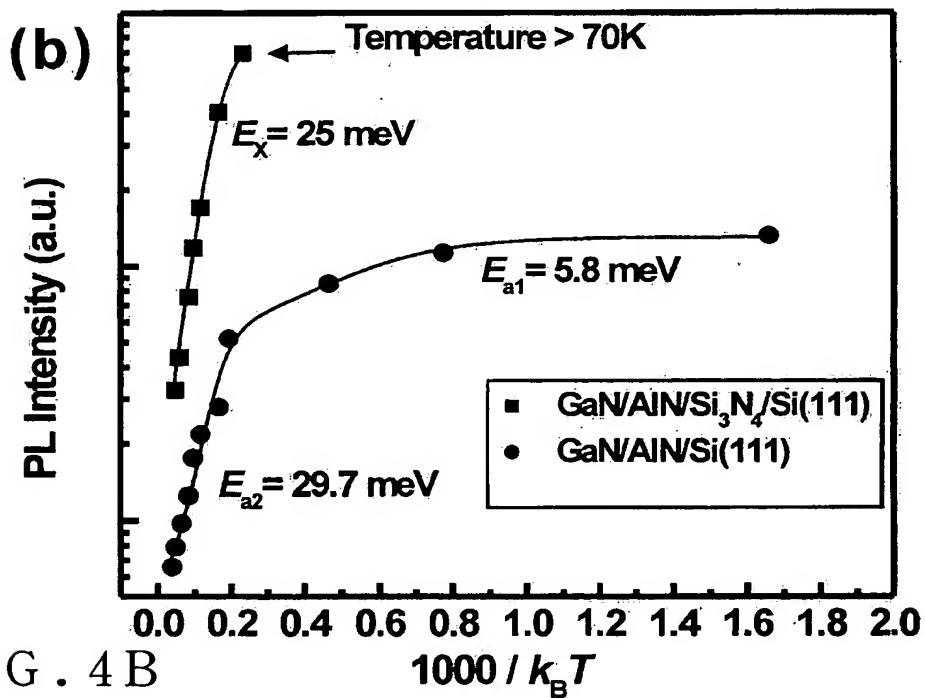


FIG. 4B

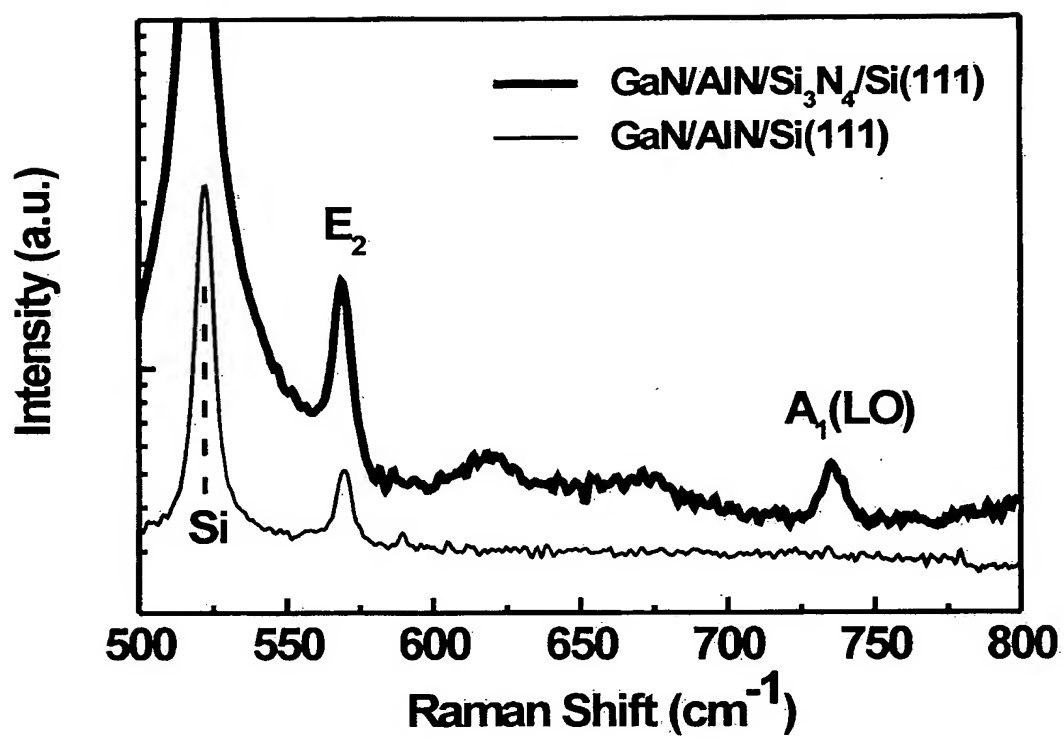


FIG . 5